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LOCALIZATION OF PLANTS IN THE FINGER LAKE REGION AND THE ADJACENT ONTARIO LOWLANDS OF CENTRAL NEW YORK *

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Central New York consists in general of two physiographic districts, the western plateau to the southward and the Lake Ontario lowlands to the northward. The former is an elevated country traversed by valleys most often but not always trending north and south, the latter an undulating plain. The prevailing soil is clay in the hills, and sandy or gravelly loam in the lowlands. The lakes of the two regions also differ in their general character. Those of the hill region are long and narrow and deep and enclosed by abrupt hills; those of the lowlands are shallow, often contain islands and shallow bars, and have low shores. The lake system of this region has often been designated the Finger Lake region, with Oneida Lake as the "thumb." Oneida and Onondaga lakes of the lowlands, however, differ from those of the uplands, not only in elevation, mode of formation, and shore characters, but also in the flora they support. They are, in reality, pools left behind when the Greater Lake Ontario subsided to its present limits. Their shores are not abrupt, nor do they rise to any considerable elevation. Oneida Lake has several islands that are wooded, the most noted being Frenchman's Island, toward its western end. It has also what the fishermen call "Blind Islands," islands that appear above the surface when the water is low but are submerged at high water. The lake, moreover, is full of stony and sandy bars,

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differing from the blind islands only because of their distance below the surface of the water. These bars are the favorite fishing grounds in the lake. The resemblance of the Blind Islands to the summits of the hills in the lowlands which bore the same relation to the former Greater Lake Ontario, shows at once that the old lake must have been full of blind islands. Islands of the same character exist near the outlet of Lake Ontario and on the north shore but none on the south shore.

One of the striking features of plant distribution is the common fact that some species of plants are widely and continuously disseminated, while others occur only in remote and limited localities. The latter are often designated rare species. In some cases species are rare in one region and abundant in another, so it may not be undesirable to use the expression in our title to designate the well-known condition where plants are confined to small areas. Plants of this description fall into three groups :

1. Plants of recent introduction.
2. Plants requiring peculiar conditions.
3. Plants with no apparent cause for limited range.

PLANTS OF RECENT INTRODUCTION. — Plants are localized upon their introduction into new regions. The rapidity with which they spread depends largely upon the capacity of the plant to spread by seed dissemination or otherwise.

Three species introduced into the region under discussion illustrate this very well.

Hyoscyamus has been known to occur on the fort grounds in Oswego for many years. It has not gotten beyond their limits yet.

Erythraea Centaurium was introduced at Oswego, how long ago, no one knows ; some have surmised as early as the French domination of Canada. In 1880 it had spread into every neighborhood within a radius of ten miles, and it may now be found even twenty miles from the city. Beyond these limits it is not known in central New York.

In 1888 a few limited localities for *Hieracium aurantiacum* were known in Oswego Co. It seems to have been there as early as in any place in the state. Now it is everywhere, and is beyond doubt one of the most pernicious and persistent weeds in the state.

Of these three, the last plant to be introduced has attained by far the widest distribution, just because it possessed qualities enabling it to thrive and spread.

PLANTS REQUIRING PECULIAR (USUALLY EDAPHIC) CONDITIONS.
 — There are several localities in this region where soil conditions are peculiar, and in these places, species, often groups of species, appear that do not occur elsewhere. Peat-bogs, localities about salt springs, marl-formations, and sand-dunes, all have species peculiar to them, and all are represented in the region. Many of the species found in these places are identical with species found along the Atlantic coast, and this led Paine, in his Catalogue of the Plants of Oneida County, page 133, to conclude that “their presence here is proof, first, that the sea originally came up to and covered the place; and, second, that these plants were flourishing at that time.” That plant migration may account for the occurrence of these plants inland, is highly probable. Nevertheless, the number of species involved and the isolation of the areas from the ocean and from each other would seem to lead naturally to Paine’s conclusion. Peat-bogs have been the subject of many recent investigations. In the *American Naturalist*, the writer has discussed the distribution of the peat-bog flora in the Lake Ontario lowlands and pointed out the occurrence in them of a considerable element representing plants of the Atlantic coast. The salt-water plants of Onondaga Lake and Salt Creek, near Montezuma, have been discussed by Clinton, Paine, and others. The flora of the marl-formations of Junius, Seneca County, as well as Bergen Swamp, have been discussed by Judge Day and Professor Dudley and in the *Flora of Monroe County*. Nothing has been published on the floras of the sand-dunes at the eastern end of Lake Ontario. The plants and conditions under which they grow are practically identical with the plants and conditions as set forth by Cowles and others in their accounts of sand-dune regions about Lake Michigan. The affinity of this region to dune regions of the Atlantic coast is obvious, as shown by the presence of a long list of identical species.

Sylvan Beach in Oneida Lake is an extensive sandy beach on which also occur many of the species found in the sand-dunes of the Great Lakes and the Atlantic coast.

PLANTS WITH NO APPARENT CAUSE FOR LIMITED RANGE. — Excluding plants of the two categories already discussed and taking up plants with no apparent reason for their limited range, it will be found that there are few if any plants endemic to this region, — also that there are still many localized species. The reason for their present distribution is an interesting subject for consideration.

In the first place it may be pointed out that while both the highland and lowland regions have many localized plants, one and the same species is scarcely ever localized in both regions. Either a localized species of the uplands does not occur in the lowlands, and *vice versa*, or a species localized in the highlands will be relatively abundant in the lowlands, and *vice versa*.

Many species could be taken to illustrate this. A few will suffice :

	Uplands	Lowlands
<i>Sagittaria subulata</i>	none	rare
<i>Rhexia virginica</i>	“	“
<i>Jeffersonia</i>	rare	none
<i>Hydrastis</i>	“	“
<i>Elcocharis mutata</i>	none	rare
<i>Juncus subterminalis</i>	“	“
<i>Solidago lanccolata</i>	rare	abundant
<i>Panicum clandestinum</i>	“	“
<i>Decodon verticillatus</i>	“	“

Another interesting thing is the fact that the localized species of the highland region occur with few exceptions in wooded uplands while those of the lowlands are confined to the lakes and water courses and their immediate vicinity. Thus *Prosartes* and *Mertensia* are localized in the highland region and do not occur in the lowlands, while *Hemicarpha*, *Dianthera*, and *Spartina* are localized in the lowlands and do not occur in the highlands.

Looking for the causes for the rarity of these plants, we may at once eliminate climate, as the climate, both as regards temperature and humidity, is practically uniform for both regions. That edaphic factors play an insignificant part seems probable, although

the lowland region has a much more sandy soil than the upland. That the localized plants of the lowland region were brought in by aquatic birds or other animals from the Atlantic coastal regions through the Hudson and Mohawk valleys seems most probable, since those valleys form a natural water-way in this region. The localized plants are at the extreme limit of their northern range. The waters have not only facilitated introduction but tended to modify temperature, thereby enabling these species to maintain a foothold. What water has done for the localized plants of the lowlands the leaf-mold of the forest floor has done for the localized plants of the uplands.

CONCERNING WOODWARDIA PARADOXA, A SUPPOSEDLY NEW FERN FROM BRITISH COLUMBIA

BY L. M. UNDERWOOD

European fern study neglects or denies the usefulness of two features that American botanists have learned to make of prime importance. The first of these is *type locality* and the second is the necessity of *accurate citation*. Not long ago the writer had occasion to deliver a polemic on some of the carelessness of continental botanists with regard to this matter.* Two years ago I was told by the worker at Kew, whose latest utterance I am here obliged to criticize, that there was enough to do of "real work" not to make it needful "to be hunting up old names, types of genera and species, and type localities." It is just this neglect of old names and type localities that causes some of my British friends to play fast and loose in the matter of making useless redescriptions of plants as new that were long since described. Some time ago † I called attention to the fact that when Baron Eggers collected a *Lygodium* in Hispaniola, the first thing Mr. Baker did was to describe it as new without stopping to look up Hispaniola as a type locality for other possible species of

* A much-named Fern. TORREYA 5 : 87-89. 1905.

† Bull. Torrey Club 29 : 620. 1902.